MC 87-I-29A(P)

PRELIMINARY REPORT
INDUSTRY SERIES

1987
Census of Manufactures

MC87-I-29A(P)
Issued May 1989

PETROLEUM AND COAL PRODUCTS

Industries 2911, 2951, 2952, 2992, and 2999

INTRODUCTION

This report presents preliminary statistics from the 1987 Census of Manufactures for those establishments classified in the industries listed above. These data will be superseded by a more comprehensive final paperbound report. The method of data collection and use of administrative data are discussed in detail in the appendix.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

The definitions of these industries are the same as those used in the 1987 Standard Industrial Classification (SIC) Manual.[1]

INDUSTRY 2911, PETROLEUM REFINING

In the 1987 Census of Manufactures, Industry 2911, Petroleum Refining, had employment of 74.3 thousand.

The total value of shipments for establishments classified in this industry was $118.0 billion.

In 1987, establishments in this industry accounted for 97 percent of products considered primary to the industry regardless of the industry in which they were produced (coverage ratio). The products primary to this industry appear in table 2 and aggregated to $114.1 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to $104.7 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 2951, ASPHALT PAVING MIXTURES AND BLOCKS

In the 1987 Census of Manufactures, Industry 2951, Asphalt Paving Mixtures and Blocks, had employment of 14.5 thousand. The employment figure was 5 percent below the 15.2 thousand reported in 1982. Compared with 1986, employment in 1987 decreased 1 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was $4.3 billion.

In 1987, establishments in this industry accounted for 94 percent of products considered primary to the industry regardless of the industry in which they were produced (coverage ratio). In 1982, the coverage ratio was 96. The products primary to this industry appear in table 2 and aggregated to $4.0 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to $2.7 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 2952, ASPHALT FELTS AND COATINGS

In the 1987 Census of Manufactures, Industry 2952, Asphalt Felts and Coatings, had employment of 13.4 thousand. The employment figure was 6 percent below the 14.2 thousand reported in 1982. Compared with 1986, employment in 1987 increased 2 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

[1] **Standard Industrial Classification Manual: 1987.** For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

Address inquiries to Bureau of the Census, Industry Division, Washington, DC 20233, or call **Jack McMahon** (301) 763-2510.

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The total value of shipments for establishments classified in this industry was $3.4 billion.

In 1987, establishments in this industry accounted for 99 percent of products considered primary to the industry regardless of the industry in which they were produced (coverage ratio). In 1982, the coverage ratio was 98. The products primary to this industry appear in table 2 and aggregated to $3.2 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to $2.1 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 2992, LUBRICATING OILS AND GREASES

In the 1987 Census of Manufactures, Industry 2992, Lubricating Oils and Greases, had employment of 11.1 thousand. The employment figure was 7 percent below the 11.9 thousand reported in 1982. Compared with 1986, employment in 1987 increased 7 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was $3.7 billion.

In 1987, establishments in this industry accounted for 70 percent of products considered primary to the industry regardless of the industry in which they were produced (coverage ratio). In 1982, the coverage ratio was 46. The products primary to this industry appear in table 2 and aggregated to $3.5 billion in 1987.

The cost of materials and services used by establishments in this industry amounted to $2.6 billion in 1987. Data on specific materials consumed appear in table 3.

INDUSTRY 2999, PETROLEUM AND COAL PRODUCTS, N.E.C.

In the 1987 Census of Manufactures, Industry 2999, Petroleum and Coal Products, N.E.C., had employment of 1.8 thousand. The employment figure was 10 percent below the 2.0 thousand reported in 1982. Compared with 1986, employment in 1987 decreased 14 percent. The 1986 data are based on the Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The total value of shipments for establishments classified in this industry was $690.9 million.

In 1987, establishments in this industry accounted for 94 percent of products considered primary to the industry regardless of the industry in which they were produced (coverage ratio). In 1982, the coverage ratio was 89. The products primary to this industry appear in table 2 and aggregated to $647.1 million in 1987.

The cost of materials and services used by establishments in this industry amounted to $431.5 million in 1987. Data on specific materials consumed appear in table 3.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in the tables in this publication:

-	Represents zero.
(D)	Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
(NA)	Not available.
(NC)	Not comparable.
(S)	Withheld because estimate did not meet publication standards on the basis of either the response rate or a consistency review.
(X)	Not applicable.
(Z)	Less than half the unit shown.
do	Ditto.
n.e.c.	Not elsewhere classified.
n.s.k.	Not specified by kind.
pt.	Part.
r	Revised.
SIC	Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

CONTACTS FOR DATA USERS

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Census/ASM		
Durables	Kenneth Hansen	(301) 763-7304
Nondurables	Michael Zampogna	(301) 763-2510
Current Industrial Reports		
Durables	Malcolm Bernhardt	(301) 763-2518
Nondurables	Thomas Flood	(301) 763-5911
Import/Export Publications	Foreign Trade Division	(301) 763-5140
Industry Analysis and Forecasts	International Trade Administration	(202) 377-4356

Table 1. Historical Statistics for the Industry: 1987 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendix.]

Year[1]	Companies[2] (no.)	All establishments[3] Total (no.)	All establishments[3] With 20 employees or more (no.)	All employees Number (1,000)	All employees Payroll (million dollars)	Production workers Number (1,000)	Production workers Hours (millions)	Production workers Wages (million dollars)	Value added by manufacture[4] (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories[4] (million dollars)	Ratios Specialization (percent)	Ratios Coverage (percent)
INDUSTRY 2911, PETROLEUM REFINING[5]															
1987 Census	201	312	219	74.3	2 833.2	49.8	102.7	1 787.0	14 203.9	104 661.0	118 020.6	2 036.1	8 768.9	99	97
INDUSTRY 2951, ASPHALT PAVING MIXTURES AND BLOCKS															
1987 Census	(NA)	1 090	198	14.5	427.3	9.9	20.7	264.9	1 588.3	2 734.7	4 305.3	122.8	202.7	94	94
1986 ASM	(NA)	(NA)	(NA)	14.7	404.7	10.6	22.1	255.4	1 330.9	2 644.0	4 024.1	102.9	183.4	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	14.6	375.4	10.6	23.7	238.6	1 164.9	2 811.9	3 971.8	[6]144.1	240.4	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	14.4	358.3	10.3	22.6	230.3	1 072.5	2 445.9	3 515.9	[6]111.2	212.4	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	15.0	343.4	10.7	22.1	230.5	1 005.2	2 242.1	3 237.4	[6]48.1	176.4	(NA)	(NA)
1982 Census	569	1 034	202	15.2	340.5	11.1	22.2	229.1	925.9	2 162.4	3 098.6	76.1	162.1	93	96
1981 ASM	(NA)	(NA)	(NA)	12.0	248.1	8.7	17.3	161.3	705.7	1 515.8	2 222.8	44.7	103.0	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	12.6	249.7	9.2	18.9	162.9	727.8	1 523.7	2 244.7	55.3	103.1	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	12.9	236.5	9.7	20.3	165.2	660.8	1 372.0	2 026.6	62.1	87.1	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	13.5	251.0	10.5	22.4	180.1	750.8	1 333.6	2 070.4	[6]69.6	110.9	(NA)	(NA)
1977 Census	590	1 023	165	12.9	190.6	9.7	20.2	134.3	507.8	1 072.1	1 578.3	57.3	62.8	95	93
1976 ASM	(NA)	(NA)	(NA)	12.9	159.5	9.6	18.6	105.7	450.8	795.9	1 250.6	[6]62.2	51.1	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	13.0	156.4	9.7	20.8	105.5	428.4	781.2	1 237.2	[6]51.3	54.0	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	14.7	147.9	9.4	20.6	102.2	468.2	772.7	1 234.0	[6]48.2	51.1	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	12.4	141.7	9.1	19.3	98.3	388.5	574.0	967.5	54.4	27.2	(NA)	(NA)
1972 Census	586	964	169	13.9	147.7	10.0	21.4	100.8	403.1	527.2	922.5	56.3	38.5	93	90
INDUSTRY 2952, ASPHALT FELTS AND COATINGS															
1987 Census	165	261	142	13.4	353.1	9.6	20.0	236.1	1 278.0	2 134.7	3 384.3	89.5	265.2	97	99
1986 ASM	(NA)	(NA)	(NA)	13.1	340.1	9.3	19.4	220.8	1 164.5	2 279.4	3 474.9	89.0	251.1	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	14.4	331.7	10.1	20.6	223.1	1 015.7	2 506.7	3 515.5	101.4	312.0	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	14.5	329.7	10.5	21.6	221.3	1 083.6	2 402.8	3 487.7	69.4	292.2	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	14.5	312.9	10.6	22.7	212.5	892.6	2 373.6	3 256.6	[6]56.0	297.1	(NA)	(NA)
1982 Census	147	273	155	14.2	288.7	10.4	21.0	195.1	816.9	1 993.7	2 849.5	57.1	256.9	95	98
1981 ASM	(NA)	(NA)	(NA)	17.1	334.3	12.4	25.6	228.2	803.1	2 118.2	2 885.5	[6]81.1	325.6	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	18.7	334.5	13.4	28.7	229.1	904.6	2 011.5	2 884.7	67.9	271.4	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	22.4	374.1	16.5	35.5	256.3	1 020.5	1 937.5	2 921.9	70.7	236.1	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	21.2	329.9	15.9	35.1	228.0	985.7	1 666.7	2 651.3	70.0	176.9	(NA)	(NA)
1977 Census	146	275	164	19.5	271.7	14.3	31.0	185.9	764.2	1 320.8	2 077.6	55.2	157.2	91	97
1976 ASM	(NA)	(NA)	(NA)	18.9	236.9	13.7	29.6	156.9	733.4	1 169.3	1 894.0	52.1	138.6	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	16.6	188.1	12.2	26.4	128.7	636.8	980.0	1 606.4	33.9	121.5	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	17.3	184.6	12.8	28.8	129.0	623.3	908.9	1 504.2	35.4	110.6	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	16.7	168.9	12.6	28.7	119.1	487.5	651.0	1 146.7	26.8	64.1	(NA)	(NA)
1972 Census	117	235	140	15.6	148.7	11.5	26.4	103.2	443.3	573.5	1 010.4	19.6	64.7	93	96
INDUSTRY 2992, LUBRICATING OILS AND GREASES															
1987 Census	370	435	161	11.1	305.8	5.4	10.9	122.2	1 107.7	2 584.9	3 684.0	79.0	428.9	95	70
1986 ASM	(NA)	(NA)	(NA)	10.4	283.0	5.3	10.7	119.4	991.4	2 339.0	3 355.6	[6]101.1	350.3	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	10.9	296.8	5.4	10.5	115.2	1 046.0	2 433.9	3 483.3	[6]79.6	383.9	(NA)	(NA)
1984 ASM	(NA)	(NA)	(NA)	11.7	309.8	6.1	12.1	130.6	1 072.8	2 561.9	3 595.1	[6]71.1	404.5	(NA)	(NA)
1983 ASM	(NA)	(NA)	(NA)	11.1	261.6	5.5	11.1	101.1	1 116.0	1 744.2	2 821.2	[6]44.6	579.0	(NA)	(NA)
1982 Census	401	473	153	11.9	266.2	5.6	11.3	102.3	902.6	1 949.5	2 875.3	67.8	364.1	94	45
1981 ASM	(NA)	(NA)	(NA)	12.6	266.1	6.4	12.5	103.5	851.8	2 257.9	3 086.9	67.7	296.1	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	13.3	248.0	6.7	13.4	95.7	799.3	1 979.6	2 751.4	[6]71.3	267.7	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	12.4	216.7	6.2	12.8	92.6	827.7	1 660.8	2 464.0	36.1	219.3	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	10.2	169.3	5.4	10.3	72.7	701.3	1 168.8	1 864.6	41.7	179.7	(NA)	(NA)
1977 Census	417	490	143	10.3	157.1	5.4	10.4	65.4	524.8	1 101.0	1 644.7	25.6	180.8	94	44
1976 ASM	(NA)	(NA)	(NA)	9.9	140.3	5.2	10.5	59.5	469.2	929.8	1 389.1	[6]28.1	177.2	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	9.7	125.9	5.1	10.0	51.7	405.1	773.5	1 175.2	[6]41.2	150.0	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	9.6	113.3	5.1	10.4	48.3	412.6	723.9	1 101.9	[6]36.6	144.1	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	8.3	91.1	4.5	9.1	39.9	285.1	491.1	781.5	10.3	83.4	(NA)	(NA)
1972 Census	387	443	117	8.1	83.3	4.4	8.6	36.2	295.8	408.9	703.1	13.7	80.9	94	40
INDUSTRY 2999, PETROLEUM AND COAL PRODUCTS, N.E.C.															
1987 Census	90	99	22	1.8	50.4	1.2	2.5	32.1	256.4	431.5	690.9	12.7	95.2	95	94
1986 ASM	(NA)	(NA)	(NA)	2.1	55.8	1.4	3.0	35.2	247.3	483.3	737.3	11.5	117.9	(NA)	(NA)
1985 ASM	(NA)	(NA)	(NA)	1.9	52.9	1.3	2.8	33.1	225.5	443.6	662.4	75.4	119.3	(NA)	(NA)
1984 ASM[7]	(NA)	(NA)	(NA)	2.1	56.3	1.5	3.3	35.3	191.3	532.5	719.9	28.5	123.8	(NA)	(NA)
1983 ASM[7]	(NA)	(NA)	(NA)	2.2	50.9	1.5	3.1	32.0	148.0	532.4	663.4	115.2	138.3	(NA)	(NA)
1982 Census	100	109	27	2.0	45.5	1.4	2.8	28.7	176.4	561.1	738.8	55.6	192.4	94	89
1981 ASM	(NA)	(NA)	(NA)	1.6	39.7	1.0	1.9	20.3	230.8	655.4	880.1	[6]21.7	152.0	(NA)	(NA)
1980 ASM	(NA)	(NA)	(NA)	1.6	31.6	1.0	1.9	17.3	236.9	457.7	689.2	[6]42.4	58.8	(NA)	(NA)
1979 ASM	(NA)	(NA)	(NA)	1.5	27.8	1.0	2.0	16.7	161.2	420.2	582.5	[6]34.2	35.9	(NA)	(NA)
1978 ASM	(NA)	(NA)	(NA)	1.6	24.2	1.2	2.4	16.4	155.4	322.2	478.0	34.3	67.2	(NA)	(NA)
1977 Census	60	70	23	1.6	22.5	1.1	2.1	14.2	157.0	306.9	463.3	14.5	59.3	97	87
1976 ASM	(NA)	(NA)	(NA)	1.0	13.1	.8	1.5	9.7	105.9	194.0	305.9	38.2	44.5	(NA)	(NA)
1975 ASM	(NA)	(NA)	(NA)	.9	11.3	.7	1.4	8.0	102.1	109.7	211.5	16.3	30.2	(NA)	(NA)
1974 ASM	(NA)	(NA)	(NA)	1.1	12.3	.9	1.9	8.6	83.5	118.1	201.9	[6]8.6	25.0	(NA)	(NA)
1973 ASM	(NA)	(NA)	(NA)	1.2	11.2	1.0	1.8	8.0	60.3	98.2	157.5	3.1	31.8	(NA)	(NA)
1972 Census	42	51	17	1.1	10.6	.9	1.8	7.5	56.3	81.6	137.6	3.0	36.7	99	91

Note: Establishments of single unit companies with up to 20 employees (cutoff varied by industry) were excluded from the mail portion of the census. Data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were estimated based on administrative-record information from other agencies in conjunction with industry averages. These establishments accounted for the following percent of total value of shipments: SIC 2911, 3%; SIC 2951, 18%; SIC 2952, 8%; SIC 2992, 16%; SIC 2999, 14%.

[1] In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1972, see 1972 Census of Manufactures, vol. II, table 1a of the industry chapter.

[2] For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

[3] Includes establishments with payroll at any time during year.

[4] Beginning with the 1982 Census of Manufactures, all respondents were requested to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior Censuses and annual surveys of manufactures in which respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, inventories and value added by manufacture reported for 1982 and later years are not comparable to prior-year data.

[5] Industry definition is changed for 1987 Census of Manufactures. An explanation of the Standard Industrial Classification revision will appear in the final industry series text that supercedes this report.

Table 1. Historical Statistics for the Industry: 1987 and Earlier Years—Con.

[6]Estimates for new capital expenditures have associated standard error of 15 percent or more and may be of limited reliability. Estimates for other data items are of acceptable reliability.
[7]Data either have associated standard errors exceeding 15 percent or are not consistent with other census series and related data; thus, these estimates may be of limited reliability.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987				1982			
		Number of companies with shipments of $100,000 or more	Receipts[2] (quantity)	Product shipments[1]		Number of companies with shipments of $100,000 or more	Receipts[2] (quantity)	Product shipments	
				Quantity[3]	Value (million dollars)			Quantity	Value (million dollars)
2911- —	**PETROLEUM REFINING**								
	Total	**(NA)**	**(X)**	**(X)**	**114 149.4**	**(NA)**	**(X)**	**(X)**	**185 978.1**
29111 —	Gasoline, including finished base stocks and blending agents[4]	(NA)	(X)	(X)	58 669.3	(NA)	(X)	(X)	95 114.7
29111 11	Aviation gasoline, except jet fuel — mil bbl	17	(S)	15.1	457.5	24	(S)	(S)	(S)
29111 31	Motor gasoline — do	75	(S)	2 521.1	57 911.4	104	(S)	2 284.8	90 211.9
29111 00	Gasoline, including finished base stocks and blending agents, n.s.k.	(NA)	(X)	(X)	300.3	(NA)	(X)	(X)	45.3
29112 —	Jet fuel	(NA)	(X)	(X)	10 435.0	(NA)	(X)	(X)	14 862.4
29112 11	Naphtha type — mil bbl	40	(S)	77.2	1 651.5	54	(S)	175.7	2 997.4
29112 13	Kerosene type — do	52	(S)	408.6	8 767.2	55	(S)	306.4	11 814.2
29112 00	Jet fuel, n.s.k.	(NA)	(X)	(X)	16.3	(NA)	(X)	(X)	50.8
29113 —	Kerosene:								
29113 00	Kerosene, except jet fuel — mil bbl	37	(S)	25.9	592.9	48	(S)	47.0	1 886.6
29114 —	Light fuel oils	(NA)	(X)	(X)	21 586.9	(NA)	(X)	(X)	37 302.6
29114 12	Distillate fuel oil, including grades No. 1, 2, light diesel-type, light gas-enrichment oils, etc. — mil bbl	95	(S)	1 010.9	21 057.4	125	(S)	980.0	36 177.4
29114 14	No. 4 type fuel oil — do	21	(S)	24.3	474.5	33	(S)	28.3	963.5
29114 00	Light fuel oils, n.s.k.	(NA)	(X)	(X)	55.1	(NA)	(X)	(X)	161.7
29115 —	Heavy fuel oils:								
29115 00	Heavy fuel oils, including grades No. 5, 6, heavy diesel-type, heavy gas-enrichment oils, etc. — mil bbl	78	(S)	350.1	5 465.3	120	(S)	445.6	11 390.6
29117 —	Lubricating oils and greases, made in a refinery (see also code 29920)	(NA)	(X)	(X)	1 205.6	(NA)	(X)	(X)	2 891.4
29117 21	Lubricating and similar oils, including hydraulic fluids, quenching and cutting oils, transformer oils, and liquid rust preventives — mil bbl	22	(S)	(S)	1 186.4	32	(S)	37.3	2 748.9
29117 31	Lubricating greases[5] — do	4				17	(S)	1.2	142.5
29117 00	Lubricating oils and greases, made in refineries, n.s.k.	(NA)	(X)	(X)	19.2	(NA)	(X)	(X)	-
29118 —	Unfinished oils and lubricating oil base stock	(NA)	(X)	(X)	4 281.2	(NA)	(X)	(X)	8 085.9
29118 13	Unfinished oils, naphthenic and paraffinic[6] — mil bbl	30	(S)	76.4	1 462.5	45	(S)	123.3	4 379.6
29118 16	Naphtha and other oils for use as petrochemical feedstocks, excluding carbon black — do	25	(S)	85.0	1 423.2	19	(S)	53.9	1 710.0
29118 17	Carbon black feedstock — do	17	(S)	12.5	182.6	15	(S)	15.1	394.8
	Lubricating oil petroleum-base stocks (for blending, compounding, and grease manufacture):[7]								
29118 51	Bright stock — mil bbl	10	(S)	4.6	152.1	14	(S)	3.1	200.1
29118 52	Neutral stock — do	17	(S)	22.2	826.1	24	(S)	16.3	1 013.5
29118 56	Red and pale oils — do	5	(S)	2.7	112.3	10	(S)	3.0	56.4
29118 59	Other oils — do	6	(S)	2.9	99.9	12	(S)	*9.5	261.5
29118 00	Unfinished oils and lubricating oil base stock, n.s.k.	(NA)	(X)	(X)	22.4	(NA)	(X)	(X)	50.0
29119 —	Asphalt[8]	(NA)	(X)	(X)	2 516.9	(NA)	(X)	(X)	2 980.3
29119 21	Paving grade asphalts — mil bbl	46	(S)	129.7	2 099.5	62	(S)	95.2	2 187.5
29119 31	Roofing grade asphalts — do	19	(S)	12.0	205.0	26	(S)	17.7	452.3
29119 41	Miscellaneous asphalts, n.e.c. — do	16	(S)	10.6	166.7	24	(S)	*10.4	285.6
29119 00	Asphalt, n.s.k.	(NA)	(X)	(X)	45.7	(NA)	(X)	(X)	54.8
2911A —	Liquefied refinery gases, including other aliphatics (feed stock and other uses), made in a refinery (see also code 28691)	(NA)	(X)	(X)	3 528.1	(NA)	(X)	(X)	4 454.7
2911A 21	Chemical raw material, including synthetic rubber components (for detailed statistics, see U.S. International Trade Commission publication, Synthetic Organic Chemicals, 1987 and 1982) — mil bbl	39	(S)	167.7	2 092.3	53	(S)	156.7	3 536.2
2911A 22	Other uses — do	31	(S)	87.7	1 185.8	35	(S)	40.3	918.5
2911A 00	Liquefied refinery gases, including other aliphatics (feed stock and other uses), made in a refinery, n.s.k.	(NA)	(X)	(X)	250.0	(NA)	(X)	(X)	-
2911D —	Other finished petroleum products, including waxes	(NA)	(X)	(X)	3 928.0	(NA)	(X)	(X)	5 507.8
2911D 11	Petrolatum — mil bbl	11	(S)	4.6	168.2	11	(S)	**3.2	122.3
2911D 23	Petroleum coke — 1,000 s tons	27	(S)	(S)	488.6	35	(S)	20 105.5	802.5
2911D 25	Calcined petroleum coke, made in a refinery — do	5	(S)	(S)	151.8				
2911D 31	Road oil[9] — mil bbl	6	(S)	.5	8.4	6	(S)	.8	21.5
2911D 41	Still gas — bil cu ft	8	(S)	30.6	54.6	10	(S)	53.5	218.8
2911D 51	Special naphthas[10] — mil bbl	11	(S)	10.6	275.0	24	(S)	16.6	629.4
2911D 55	Aromatics, made in a refinery (see also code 28656): Chemical raw material (for detailed statistics, see U.S. International Trade Commission publication, Synthetic Organic Chemicals, 1987 and 1982)) — mil bbl	18	(S)	56.4	2 017.0	23	(S)	45.8	2 402.7
2911D 57	Other uses — do	4				9	(S)	11.8	467.7
2911D 62	Waxes, made in a refinery: Microcrystalline (see also code 2999020)[11] — mil bbl	8	(S)	(S)	47.2	8	(S)	(S)	41.0
	Crystalline (see also code 2999030):								
2911D 72	Fully refined — mil bbl	13	(S)	3.6	177.7	11	(S)	2.7	197.4
2911D 82	Other — do	4	(S)	.7	34.2	12	(S)	**2.1	100.3
2911D 99	Other finished petroleum products — do	23	(X)	(S)	415.5	37	(S)	(S)	504.3
2911D 00	Other finished petroleum products, including waxes, n.s.k.	(NA)	(X)	(X)	89.8	(NA)	(X)	(X)	[12]

See footnotes at end of table.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987				1982			
		Number of companies with shipments of $100,000 or more	Receipts[2] (quantity)	Product shipments[1] Quantity[3]	Product shipments[1] Value (million dollars)	Number of companies with shipments of $100,000 or more	Receipts[2] (quantity)	Product shipments Quantity	Product shipments Value (million dollars)
2911- —	**PETROLEUM REFINING**—Con.								
29110 —	Petroleum products, n.s.k.	(NA)	(X)	(X)	1 940.3	(NA)	(X)	(X)	1 521.2
29110 00	Petroleum products, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	(X)	(X)	1 940.3	(NA)	(X)	(X)	[12] 521.2
29110 02	Petroleum products, n.s.k., typically for establishment with less than 10 employees (see note)	–	(X)	(X)	–	–	(X)	(X)	–

1987 product code	Product	1987			1982		
		Number of companies with shipments of $100,000 or more	Product shipment[1] Quantity[3]	Product shipment[1] Value (million dollars)	Number of companies with shipments of $100,000 or more	Product shipment[1] Quantity[3]	Product shipment[1] Value (million dollars)
2951- —	**ASPHALT PAVING MIXTURES AND BLOCKS**						
	Total	**(NA)**	**(X)**	**4 045.1**	**(NA)**	**(X)**	**2 881.0**
29510 —	Paving mixtures and blocks:						
29510 11	Liquid asphalt and tar paving materials: Emulsified asphalt, including liquid additives (1,000 bbl)	62	(S)	476.4	81	**13 161.0	376.7
29510 15	Other liquid asphalt and tar paving materials, including cut-backs (do.)	44	(S)	260.5	35	**3 595.7	109.8
29510 51	Asphalt and tar paving mixtures (including bituminous or asphaltic concrete) and asphaltic paving cements	(NA)	(X)	2 366.5	362	(X)	1 879.9
29510 98	Other paving mixtures, except brick, concrete, granite, or stone	18	(X)	53.4	22	(X)	48.6
29510 00	Paving mixtures and blocks, n.s.k., typically for establishments with 5 employees or more (see note)	(NA)	(X)	768.8	(NA)	(X)	447.7
29510 02	Paving mixtures and blocks, n.s.k., typically for establishments with less than 5 employees (see note)	(NA)	(X)	119.4	(NA)	(X)	18.3
2952- —	**ASPHALT FELTS AND COATINGS**						
	Total	**(NA)**	**(X)**	**3 159.6**	**(NA)**	**(X)**	**2 633.2**
29521 —	Asphalt and tar saturated felts and boards for nonbuilding use	(NA)	(X)	38.4	(NA)	(X)	64.4
29521 13	Felts for nonbuilding uses (automotive, etc.): Organic	2	(X)	[13]	4	(X)	31.3
29521 15	Inorganic	1					
29521 31	Asphalt and tar products (except felts, coatings, cement) for nonbuilding use (i.e., automotive, etc.) (1,000 s tons)	9	(S)	[13]38.4	15	(S)	31.5
29521 00	Asphalt and tar saturated felts and boards for nonbuilding use, n.s.k.	–	(X)	–	(NA)	(X)	1.6
29522 —	Roofing asphalts and pitches, coatings, and cements	(NA)	(X)	451.0	(NA)	(X)	486.8
29522 12	Roofing asphalt (1,000 s tons)	13	*916.1	126.4	18	932.3	173.7
	Asphaltic roofing coatings and cements:						
29522 51	Fibrated asphaltic coatings (mil gal)	21	**43.9	99.6	34	45.3	106.9
29522 55	Nonfibrated asphaltic coatings (do.)	14	(S)	76.8	26	**7.6	18.3
29522 61	Asphaltic roofing cements (do.)	22	(S)	52.9	30	(S)	76.3
29522 98	Other roofing asphalts and pitches, coatings, and cements, including coal-tar base coatings, cements, and roofing pitches	19	(X)	78.5	36	(X)	78.5
29522 00	Roofing asphalts and pitches, coatings, and cements, n.s.k.	(NA)	(X)	16.8	(NA)	(X)	15.1
29523 —	Prepared asphalt and tar roofing and siding products	(NA)	(X)	2 375.1	(NA)	(X)	2 030.8
	Smooth-surfaced roll roofing and cap sheets (including sanded, talc, mica, and other fine material surfacing):						
29523 21	Organic base (mil sales sq)	12	(S)	51.5	15	7.9	47.4
29523 22	Fiberglass base (do.)	13	(S)	238.2	13	16.1	93.7
	Mineral-surfaced roll roofing and cap sheets (including 17-inch and 19-inch selvage edged):						
29523 23	Organic base (mil sales sq)	11	9.4	74.6	18	11.9	129.9
29523 24	Fiberglass base (do.)	12	(S)	135.4	10	2.3	29.5
	Shingles:						
	Organic base:						
29523 25	235 to 240 lb/sq (mil sales sq)	6	3.6	67.6	15	16.6	306.6
29523 26	All other weights (excluding laminated) (do.)	5	9.2	162.6	8	6.3	117.7
	Inorganic base:						
29523 27	215 to 235 lb/sq (mil sales sq)	10	*21.6	347.2	12	30.5	577.5
29523 28	All other weights (excluding laminated) (do.)	11	47.2	743.4	8	6.0	127.7
29523 29	Organic and/or inorganic base laminated or multilayered shingles (do.)	11	*9.2	282.9	6	1.5	55.5
29523 31	Individual shingles, organic or inorganic base, all styles (do.)	5	.6	15.4	13	1.4	34.2
29523 33	Mineral-surfaced insulating board base siding (all types and finishes), organic or inorganic base (do.)	2	(D)	(D)	1	(D)	[14]
	Saturated asphalt and tar felts:						
29523 60	Ply felts, organic base (1,000 s tons)	14	(S)	57.3			
29523 62	Ply felts, fiberglass base (do.)	8	(S)	46.3	(NA)	(NA)	212.6
29523 64	Other felts, organic base (do.)	10	(S)	79.4			
29523 66	Other felts, fiberglass base (do.)	3	(D)	(D)			
29523 99	Other prepared asphalt and tar products for roofing and siding, including board products and sheathing and felt base roll form and shingle form	13	(X)	41.3	16	(X)	[14]278.0

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 product code	Product	1987			1982		
		Number of companies with shipments of $100,000 or more	Product shipment[1]		Number of companies with shipments of $100,000 or more	Product shipment[1]	
			Quantity[3]	Value (million dollars)		Quantity[3]	Value (million dollars)
2952- —	**ASPHALT FELTS AND COATINGS**—Con.						
29523 —	Prepared asphalt and tar roofing and siding products—Con.						
29523 00	Prepared asphalt and tar roofing and siding products, n.s.k.	(NA)	(X)	27.0	(NA)	(X)	20.6
29520 —	Asphalt felts and coatings, n.s.k.	(NA)	(X)	295.1	(NA)	(X)	71.2
29520 00	Asphalt felts and coatings, n.s.k., typically for establishments with 5 employees or more (see note)	(NA)	(X)	203.1	(NA)	(X)	62.5
29520 02	Asphalt felts and coatings, n.s.k., typically for establishments with less than 5 employees (see note)	(NA)	(X)	92.0	(NA)	(X)	8.7

1987 product code	Product	1987				1982			
		Number of companies with shipments of $100,000 or more	Receipts[2] (quantity)	Product shipments[1]		Number of companies with shipments of $100,000 or more	Receipts[2] (quantity)	Product shipments	
				Quantity[3]	Value (million dollars)			Quantity	Value (million dollars)
2992- —	**LUBRICATING OILS AND GREASES**								
	Total	**(NA)**	**(X)**	**(X)**	**3 547.2**	**(NA)**	**(X)**	**(X)**	**2 716.3**
29920 —	Lubricating oils and greases, not made in a refinery (see also code 29117):								
29920 21	Lubricating and similar oils, including hydraulic fluids, quenching and cutting oils, transformer oils, and liquid rust preventives—mil bbl.	(NA)	(S)	(S)	2 517.6	201	(S)	*23.6	2 065.0
29920 31	Lubricating greases[5]—do.	51	(S)	(S)	333.5	66	(S)	**2.6	323.7
29920 00	Lubricating oils and greases not made in a refinery, n.s.k., typically for establishments with 10 employees or more (see note)	(NA)	(X)	(X)	634.7	(NA)	(X)	(X)	309.7
29920 02	Lubricating oils and greases not made in a refinery, n.s.k., typically for establishments with less than 10 employees (see note)	(NA)	(X)	(X)	61.4	(NA)	(X)	(X)	19.9

1987 product code	Product	1987			1982		
		Number of companies with shipments of $100,000 or more	Product shipment[1]		Number of companies with shipments of $100,000 or more	Product shipment[1]	
			Quantity[3]	Value (million dollars)		Quantity[3]	Value (million dollars)
2999- —	**PETROLEUM AND COAL PRODUCTS, N.E.C.**						
	Total	**(NA)**	**(X)**	**647.1**	**(NA)**	**(X)**	**801.8**
29990 —	Petroleum and coal products, n.e.c.:						
29990 15	Packaged fuel and fuel briquettes, except wood charcoal briquettes—1,000 s tons	1	(D)	(D)	2	(D)	(D)
	Waxes, not made in a refinery:						
29990 20	Microcrystalline (see also code 2911D62)[11]—mil bbl.	10	(S)	91.3	12	117.8	101.5
29990 30	Crystalline (see also codes 2911D72 and 82)—do.	4					
29990 91	Calcined petroleum coke, not made in a refinery—1,000 s tons	12	(S)	362.3	17	4 193.7	568.0
29990 93	Petroleum pitch—do.	3	(D)	(D)	27	(X)	67.4
29990 99	Other petroleum and coal products, n.e.c.—do.	17	(S)	70.2			
29990 00	Petroleum and coal products, n.e.c., n.s.k., typically for establishments with 5 employees or more (see note)	(NA)	(X)	49.9	(NA)	(X)	(D)
29990 02	Petroleum and coal products, n.e.c., n.s.k., typically for establishments with less than 5 employees (see note)	(NA)	(X)	62.8	(NA)	(X)	7.1

Note: In 1987 Census of Manufactures, data for establishments of small single unit companies with up to 20 employees were estimated from administrative-record data rather than data actually collected from respondents. Employment cutoffs used for administrative records for each industry and shipments figures are included in code ending with "002". In both 1987 and 1982 Censuses of Manufactures, products not completely identified on standard forms were coded in appropriate product class (five-digit) followed by "00" or to appropriate product group code (four-digit) followed by "000".

[1]Data reported by all producers, not just those with shipments of $100,000 or more.

[2]Reporting companies were requested to report quantities of refined petroleum received in refineries for further processing and to classify items in the same manner as they were billed by shipper, regardless of how refinery (or blending and compounding establishment) would otherwise classify item.

[3]For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

[4]Includes all finished gasolines, finished base stocks and blending agents, such as alkylate, polymers (dimer, codimer, etc.), hydropolymers (hydrodimer, hydrocodimer, etc.), cumene, isopentane, isohexane, neohexane, iso-octane, motor benzol (benzene), and other blending agents derived from petroleum. Excludes natural gasoline derived from natural gas.

[5]Includes greases for aviation, automotive, industrial, and railroad uses; launching grease, cutting, drawing, and grinding compounds; and paste. Also includes paste rust-preventative compounds and thread compounds.

[6]Includes such products as cracking stock, unfinished gasoline requiring further distillation, naphtha stocks, slops, wax distillate, and other unfinished petroleum oils. Excludes lubricating oil base stocks, natural gasoline, and cycle condensates.

[7]Includes light, medium, heavy natural, and residual stocks.

[8]Includes asphalt and fluxes for paving, roofing, waterproofing, briquetting, mastic pipe coating, and molding composition; cutback asphalt, emulsified asphalt, and fluxes produced in petroleum refineries; and other asphaltic products, except road oil and fuel for heating purposes.

[9]Represents residual asphaltic oil used for suface treatment of roads and highways.

[10]Includes petroleum ether, rubber solvent, mineral spirits (petroleum spirits), varnish makers' and painters' naphtha, high-solvency naphtha, benzol diluent, lacquer diluent, cleaners' naphtha, Stoddard solvent, extraction solvents, and other petroleum distillates shipped as solvents.

[11]Represents amorphous paraffin of melting point not less than 145°F.

Table 2. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1987 and 1982—Con.

[12]For 1982, product code 2911D00 was included with product code 2911000.
[13]For 1987 product codes 2952113 and 2952115 are included with product class 2952131 to avoid disclosing data for individual companies.
[14]For 1982, product code 2952333 was included with product code 2952399 to avoid disclosing data for individual companies.

Table 3. Materials Consumed by Kind: 1987 and 1982

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity[1]	Delivered cost (million dollars)	Quantity[1]	Delivered cost (million dollars)
	INDUSTRY 2911, PETROLEUM REFINING				
	Materials, containers, and supplies	**(X)**	**98 324.7**	**(X)**	**(3)**
	Crude petroleum, including lease condensate: mil bbl				
131111	Domestic do	3 007.9	52 996.3	(NA)	(NA)
131112	Foreign do	1 640.5	28 949.9	(NA)	(NA)
291181	Foreign unfinished oils (received from foreign countries for further processing) do	30.0	584.2	(NA)	(NA)
	Natural gas liquids:				
132128	Ethane (C_2), at least 80 percent purity mil bbl	24.8	125.7	(NA)	(NA)
132129	Propane (C_3), at least 80 percent purity do	27.5	257.9	(NA)	(NA)
132120	Butane (C_4), at least 80 percent purity do	103.8	1 687.2	(NA)	(NA)
132124	Gas mixtures (C_2, C_3, C_4) do	30.1	369.4	(NA)	(NA)
132125	Isopentane and natural gasoline do	69.9	1 118.6	(NA)	(NA)
132126	Plant condensate do	(D)	(D)	(NA)	(NA)
132127	Other natural gas liquids do	18.8	332.4	(NA)	(NA)
291107	Benzol (benzene) (100 percent C_6H_6) do	1.6	71.9	(NA)	(NA)
286519	Toluene and xylene (100 percent basis) mil lb	1 107.0	107.7	(NA)	(NA)
	Additives, except animal and vegetable oils:				
280011	Antioxidants, antiknock compounds, and inhibitors mil lb	231.9	188.1	(NA)	(NA)
280012	Other additives, including soaps and detergents do	320.0	214.4	(NA)	(NA)
207001	Animal and vegetable oils do	(D)	(D)	(NA)	(NA)
281980	Chemical catalytic preparations	(X)	479.8	(X)	(NA)
28123B	Sodium hydroxide (caustic soda 100 percent NaOH) 1,000 s tons	257.5	40.6	(NA)	(NA)
281931	Sulfuric acid (100 percent H_2SO_4), except spent do	1 443.8	94.8	(NA)	(NA)
	Containers:				
340001	Metal	(X)	24.9	(X)	(NA)
260091	Paper and paperboard	(X)	(D)	(X)	(NA)
308961	Plastics	(X)	41.8	(X)	(NA)
265522	Fiber cans, bodies with combinations of fiber and other materials (foil, plastics, etc.) with metal ends	(X)	14.9	(X)	(NA)
290004	Cost of materials received from petroleum refineries and lube manufacturers	(X)	4 025.2	(X)	(NA)
970099	All other materials and components, parts, containers, and supplies	(X)	4 320.1	(X)	(NA)
971000	Materials, containers, and supplies, n.s.k.[2]	(X)	2 193.5	(X)	(NA)
	INDUSTRY 2951, ASPHALT PAVING MIXTURES AND BLOCKS				
	Materials, containers, and supplies	**(X)**	**2 407.3**	**(X)**	**1 834.3**
	Asphalts:				
291192	Paving grade asphalts mil bbl	**51.0	903.9	**33.4	780.6
291193	Roofing grade asphalts do	(S)	130.5	(S)	6.4
291194	Asphalts other than paving and roofing grade do			(S)	20.7
144201	Sand and gravel 1,000 s tons	**70 936.0	366.2	**47 855.0	220.4
970099	All other materials and components, parts, containers, and supplies	(X)	317.1	(X)	342.5
971000	Materials, containers, and supplies, n.s.k.[2]	(X)	689.6	(X)	463.7
	INDUSTRY 2952, ASPHALT FELTS AND COATINGS				
	Materials, containers, and supplies	**(X)**	**1 920.6**	**(X)**	**1 771.1**
	Asphalts:				
291192	Paving grade asphalts mil bbl	**3.8	71.1	**.3	9.5
291193	Roofing grade asphalts do	**24.1	482.7	28.8	760.2
291194	Asphalts other than paving and roofing grade do	(S)	40.2	**1.6	46.7
2621B1	Roofing felts (unsaturated) 1,000 s tons	**426.8	87.5	629.2	148.4
322931	Glass fiber, roving, mats, etc. mil lb	*273.7	294.9	158.2	228.3
329501	Roofing granules 1,000 s tons	4 086.2	286.6	2 592.1	181.4
144201	Sand and gravel do	**2 257.2	46.7	(S)	22.1
970099	All other materials and components, parts, containers, and supplies	(X)	390.4	(X)	262.9
971000	Materials, containers, and supplies, n.s.k.[2]	(X)	220.5	(X)	111.8

See footnotes at end of table.

Table 3. **Materials Consumed by Kind: 1987 and 1982**—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendix. For meaning of abbreviations and symbols, see introductory text]

1987 material code	Material	1987		1982	
		Quantity[1]	Delivered cost (million dollars)	Quantity[1]	Delivered cost (million dollars)
	INDUSTRY 2992, LUBRICATING OILS AND GREASES				
	Materials, containers, and supplies	**(X)**	**2 379.3**	**(X)**	**1 790.3**
	Additives, except animal and vegetable oils:				
280011	Antioxidants, antiknock compounds, and inhibitors—mil lb	*275.7	138.5	*252.0	88.5
280012	Other additives, including soaps and detergents—do	387.9	351.9	251.5	136.0
207001	Animal and vegetable oils—do	(S)	31.0	**74.3	16.8
281980	Chemical catalytic preparations	(X)	1.9	(X)	(D)
281236	Sodium hydroxide (caustic soda, 100 percent NaOH)—1,000 s tons	**5.6	1.0	*10.4	2.3
281931	Sulfuric acid (100 percent H_2SO_4), except spent—do	(S)	.1	(D)	(D)
	Containers:				
340001	Metal	(X)	110.1	(X)	71.4
260091	Paper and paperboard	(X)	38.8	(X)	20.0
308961	Plastics	(X)	149.9	(X)	(4)
265522	Fiber cans, bodies with combinations of fiber and other materials (foil, plastics, etc.) with metal ends	(X)	18.9	(X)	51.0
290004	Cost of materials received from petroleum refineries and lube manufacturers	(X)	785.8	(X)	762.6
970099	All other materials and components, parts, containers, and supplies	(X)	284.3	(X)	*302.3
971000	Materials, containers, and supplies, n.s.k.[2]	(X)	467.3	(X)	330.1

[1]For some establishments, data have been estimated from central unit values which are based on quantity-cost relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: * 10 to 19 percent estimated; ** 20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

[2]Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

[3]Data for 1987 and 1982 are not comparable due to a change in the definition for industry 2911 for the 1987 Census of Manufactures. An explanation of the Standard Industrial Classification revision will appear in the final industry series text that supercedes this report.

[4]For 1982, material code 308961 was included with material code 970099.

APPENDIX
Scope and Coverage and Explanation of Terms

GENERAL

The 1987 Census of Manufactures is the 32nd census of manufacturing establishments conducted in the United States. For 1987, it was conducted as part of the economic censuses, which included the censuses of mineral industries, construction industries, retail and wholesale trades, service industries, selected transportation activities, and minority-owned and women-owned businesses, under authority of title 13 of the United States Code. Title 13 specifies that an economic census be conducted every 5 years to cover years ending in 2 and 7.

SCOPE AND COVERAGE

Establishment Basis of Reporting

The census of manufactures is conducted on an establishment basis. All manufacturing establishments with one paid employee or more at any time during the year are covered by the census of manufactures. Therefore, a company operating at more than one location is required to file a separate report for each location. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units which service manufacturing establishments of the same company. Where these auxiliary operations are conducted at the same location as the manufacturing operation, they are usually included in the report for the operating manufacturing establishment.

Use of Administrative Records

From a universe of approximately 350,000 manufacturing establishments in the 1987 Census of Manufactures, approximately 150,000 small single-establishment companies were excused from filing reports. Selection of the small establishment nonmail cases was done on an industry-by-industry basis. A variable cutoff was used to determine those establishments for which administrative records were to be used in place of a census report. The cutoffs were selected so the administrative-record cases would account for approximately 3 percent or less of the value of shipments for the industry. These cutoffs were then adjusted so that all single-establishment companies with less than 5 employees were excluded from the mail canvass, while all establishments with more than 20 employees were included. Where establishments in the 5 to 20 employee size range were included in the mail canvass, an abbreviated census form was frequently used.

For these nonmail establishments, (and a small number of larger establishment whose reports were not received at the time the data were tabulated) data on employment, payroll, and receipts were obtained from administrative records of other government agencies rather than from census forms. The administrative-record information was then used in conjunction with industry averages to estimate the data for these establishments. The value of shipments and cost of materials were not distributed among specific products and materials but were included in the product and material "not specified by kind" (n.s.k.) categories.

EXPLANATION OF TERMS

Number of establishments and companies–A separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

All employees–Includes all full-time and part-time employees on the payrolls at any time during the year. Included are all persons on paid sick leave, paid holidays, and paid vacations. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average of those for midmonth payroll periods of March, May, August, and November.

Production workers–Includes workers up through the working-supervisor level engaged in fabricating, processing, assembling, inspecting, receiving, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial, guard services, product development, auxiliary production for plant's own use (e.g., powerplant), recordkeeping, and other closely associated services. Truckdrivers delivering ready-mixed concrete are also included in production workers.

Other employees–Includes nonproduction personnel, including those engaged in the following activities: supervision above working-supervisor level, sales (including driver/salespersons), sales delivery (truckdrivers and helpers), advertising, credit collection, installation and

servicing of own product, clerical and routine office functions, executive, purchasing, finance, legal, personnel (including cafeteria, etc.), professional, and technical employees.

Payroll–Includes the gross earnings for the "employees" defined above, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. Respondents were told that in reporting they could follow the definition of payrolls used for calculating the Federal withholding tax.

Production-worker hours–Covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the plant.

Cost of materials–Refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuels consumed, regardless of whether they were purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (a) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year; (b) electric energy purchased; (c) fuels consumed for heat, power, or generating electricity; (d) work done by others on materials or parts furnished by manufacturing establishments (contract work); and (e) products bought and resold in the same condition.

Specific materials consumed (table 3)–In addition to the total cost of materials which every establishment was required to report, information was also collected for most manufacturing industries on the consumption of major materials used in manufacturing. These inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Establishments consuming less than a specified amount (usually $10,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which administrative records were used was estimated as "not specified by kind" (n.s.k.).

Value of shipments and other receipts–Generally refers to received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts such as receipts for contract work performed for others, installation and repair receipts, sale of scrap, and sale of products bought and resold without further processing. Included are all items made by or for the establishment from materials owned by it whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In a few industries, the value of production or value of work completed is used instead of value of shipments. These industries are identified in the introduction and are footnoted in table 1.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, that is, including not only the direct costs of production but also a reasonable proportion of "all other costs" (including company overhead and profit).

Shipments or production of individual products (table 2)–In the 1987 census, detailed shipment information was collected for approximately 11,000 individual products. These products are identified by a seven-digit code and are grouped into approximately 1,500 classes of products, which in turn are primary to 459 four-digit industries. Data at the five-digit product-class level have been collected each year as part of the annual survey of manufactures. Information at the seven-digit level, collected for many industries in the current industrial reports program, is not included in this table.

Value added by manufacture–This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments for products manufactured plus receipts for services rendered. The result of this calculation is then adjusted by the addition of value added by merchandising operations (that is, the difference between the sales value and cost of merchandise sold without further manufacturing, processing, or assembly) plus the net change in finished goods and work-in-process inventories between the beginning and end of the year.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1), value added is adjusted only for the change in work-in-process inventories between the beginning and end of the year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

Value added avoids the duplication in the figure for value of shipments which results from the use of products of some establishments as materials by others. Value

added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

Expenditures for new plant and equipment–Establishments in operation and any known plants under construction were asked to report their expenditures for (a) permanent additions and major alterations to manufacturing establishments and (b) new machinery and equipment used for replacement and additions to plant capacity if they are of the type for which depreciation accounts are ordinarily maintained.

These totals exclude expenditures for used plant and equipment, expenditures for land, and cost of maintenance and repairs charged as current operating expenses. Data for used plant and equipment will be published in the final industry bulletin.

End-of-year inventories–Comprised of (a) finished products; (b) work-in-process; and (c) materials, supplies, fuels, etc. Beginning in 1982, respondents were asked to report their inventories at (the lower of) cost or market prior to adjustment to LIFO cost. This is a change from prior years in which respondents were permitted to value their inventories using any generally accepted accounting method. Therefore, 1982 through 1987 data for inventories are not strictly comparable to prior-year data.

Specialization and coverage ratios–An establishment is classified in a particular industry if its shipments of primary products of the industry exceed in value its shipments of the products of any other single industry. An establishments' shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). The following ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in table 1 and data on product shipments shown in table 2.

Specialization ratio–Represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio–Represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments, wherever classified.